

1 **WHAT IS CLAIMED IS:**

2 1. An automatic diaphragm assembly for a lens, and the diaphragm
3 assembly comprising:

4 a body having a front, a rear, a diaphragm chamber with a bottom
5 defined in the rear and a distal through hole defined completely through the
6 bottom of the diaphragm chamber;

7 an aperture adjustment mechanism movably mounted in the diaphragm
8 chamber and comprising two reciprocal blades slidably mounted in the
9 diaphragm chamber, and each of the reciprocal blades having an inward edge
10 facing to each other to define an aperture aligned with the distal through hole;
11 and

12 an actuating device mounted on the body, connected to the reciprocal
13 blades to continuously actuate the reciprocal blades moving to define the
14 aperture.

15 2. The automatic diaphragm assembly as claimed in claim 1, wherein
16 the diaphragm assembly further comprises a motor mount formed
17 integrally from the front of the body; and
18 the actuating device comprises

19 a motor mounted in the motor mount and having a shaft
20 extended toward the front of the body and a stator;
21 an interface electrically connected to the motor and having an
22 inner segment extended into the motor;
23 a transverse rod attached to and rotated by the motor shaft and
24 having two opposite ends;

1 two driving studs are respectively attached to the ends of the
2 transverse rod and extended into the diaphragm chamber to respectively connect
3 to the reciprocate blades; and

4 a current sensor mounted on the inner segment of the interface in
5 the motor to sense a current of the stator of the motor.

6 3. The automatic diaphragm assembly as claimed in claim 2, wherein
7 the body further has two curved slots defined completely through the
8 bottom of the diaphragm chamber;

9 each of the driving studs has an outside end, and the outside ends are
10 respectively extended into and slidably held in the curved slots;

11 each of the reciprocal blades has an overlapping segment and a driven
12 arm extended from the overlapping segment, and each driven arm has a
13 longitudinal through hole aligned with a respective one of the curved slots; and
14 the aperture adjustment mechanism further comprises an end cap
15 slidably mounted in the longitudinal through hole of each one of driven arms and
16 attached to the driving stub in the aligned curved slot.

17 4. The automatic diaphragm assembly as claimed in claim 3, wherein
18 the body further has four positioning nubs protruded from the bottom of
19 the diaphragm chamber and the positioning nubs are arranged in a rectangular
20 disposition; and

21 each of the reciprocal blades has multiple transverse slots and each of the
22 transverse slots slidably holds a respective one of the positioning nubs.

23 5. The automatic diaphragm assembly as claimed in claim 3, wherein the
24 inward edge of each of the reciprocal blades is defined in the overlapping

1 segment and has a V-shaped profile with an opening facing each other.

2 6. The automatic diaphragm assembly as claimed in claim 4, wherein the
3 inward edge of each of the reciprocal blades is defined in the overlapping
4 segment and has a V-shaped profile with an opening facing each other.

5 7. The automatic diaphragm assembly as claimed in claim 2, wherein the
6 motor is a step motor.

7 8. The automatic diaphragm assembly as claimed in claim 2, wherein the
8 current sensor comprises a Hall element to sense currents in the stator.

9 9. The automatic diaphragm assembly as claimed in claim 2, further
10 comprising an end cover attached to the rear of the body to cover the diaphragm
11 chamber and having a proximal through hole aligned with the distal through hole
12 in the body.

13 10. The automatic diaphragm assembly as claimed in claim 6, wherein
14 the motor is a step motor.

15 11. The automatic diaphragm assembly as claimed in claim 10, wherein
16 the current sensor comprises a Hall element to sense currents in the stator.

17 12. The automatic diaphragm assembly as claimed in claim 11, further
18 comprising an end cover attached to the rear of the body to cover the diaphragm
19 chamber and having a proximal through hole aligned with the distal through hole
20 in the body.